

REMARKS

In view of the above amendments and the following remarks, reconsideration of the rejections contained in the Office Action of December 9, 2009 is respectfully requested.

By this Amendment, claims 73 and 79 have been amended, and new claims 87 and 88 have been added. Thus, claims 73-88 are currently pending in the application. No new matter has been added by these amendments.

On pages 3-8 of the Office Action, the Examiner rejected claims 73, 74, 76-80 and 82-84 under 35 U.S.C. § 103(a) as being unpatentable over Clingman et al. (US 5,130,163), as evidenced by “GE Silicones RTV 11” Data Sheet (hereinafter RTV 11 Sheet) and Kang et al. (US 5,800,695), and optionally, further in view of Montierth (US 4,411,856). On pages 8-10 of the Office Action, the Examiner rejected claims 75 and 81 under 35 U.S.C. § 103(a) as being unpatentable over Clingman, as evidenced by RTV 11 Sheet in view of Kang, and further in view of the admitted state of the prior art. On pages 10-11 of the Office Action, the Examiner rejected claims 85-86 under 35 U.S.C. § 103(a) as being unpatentable over Clingman, as evidenced by RTV 11 Sheet, in view of Kang and optionally Montierth, and further in view of Emer (US 6,380,512). For the reasons discussed below, it is respectfully submitted that the amended claims are clearly patentable over the prior art of record.

Amended independent claim 73 recites a method of forming a thermal barrier coating on a surface of a component having cooling holes. The method of claim 73 includes forming masking pins in the cooling holes by injecting a liquid elastic body into each of the cooling holes, and by thereafter hardening the liquid elastic body in the cooling holes, wherein the hardening of the liquid elastic body includes volumetric shrinkage of the liquid elastic body, and *wherein the cooling holes are formed in the surface of the component such that the cooling holes extend to an air passageway slot formed in the component, each of the cooling holes having a diameter that is larger than a width of the air passageway slot.* The method of claim 73 also includes forming the thermal barrier coating on the surface of the component by spray coating after the forming of the masking pins. Further, claim 73 recites that an injection amount of the liquid elastic body is adjusted so that a surface of the elastic body injected into each of the cooling holes protrudes above the surface of the component when the liquid elastic body is injected into the cooling holes, and so that the masking pins after hardening do not protrude above the surface of the component.

Amended independent claim 79 recites a method of forming a thermal barrier coating on a surface of a component having cooling holes. The method of claim 79 includes forming masking pins in the cooling holes by injecting a liquid elastic body into each of the cooling holes, and by thereafter hardening the liquid elastic body in the cooling holes, wherein the hardening of the liquid elastic body includes volumetric shrinkage of the liquid elastic body, and *wherein the cooling holes are formed in the surface of the component such that the cooling holes extend to an air passageway slot formed in the component, each of the cooling holes having a diameter that is larger than a width of the air passageway slot.* The method of claim 79 also includes blasting the surface of the component so as to coarsen the surface of the component, and forming the thermal barrier coating on the surface of the component by spray coating after the forming of the masking pins and the blasting of the surface of the component. Further, claim 79 recites that an injection amount of the liquid elastic body is adjusted so that a surface of the elastic body injected into each of the cooling holes protrudes above the surface of the component when the liquid elastic body is injected into the cooling holes, and so that the masking pins after hardening do not protrude above the surface of the component.

Clingman discloses a coating method which, as shown in Figs. 2-4, includes maskant plugs 30 being formed in side perforations 22 of an inside lamina 12. However, Clingman does not disclose forming masking pins in the cooling holes by *injecting a liquid elastic body into each of the cooling holes, wherein the cooling holes are formed in the surface of the component such that the cooling holes extend to an air passageway slot formed in the component, with each of the cooling holes having a diameter that is larger than a width of the air passageway slot,* as required by independent claims 73 and 79. In particular, on page 3 of the Office Action, the Examiner indicates that the perforations 22 of Clingman correspond to the cooling holes of claims 73 and 79. In this regard, Clingman does not disclose that the perforations 22 extend to an air passageway slot formed in the component and that the perforations 22 each have a diameter that is larger than a width of the air passageway slot, as required by claims 73 and 79.

Further, on page 4 of the Office Action, the Examiner notes that Clingman discloses the use of RTV-11 as a silicone rubber that is used to make the masking plugs 30. In this regard, the Examiner cites the RTV-11 Sheet as disclosing that one of ordinary skill in the art would recognize that the silicone rubber of Clingman is a liquid. However, as the RTV-11 Sheet only discusses the properties of a silicone rubber, it is respectfully submitted that the RTV-11 Sheet

does not disclose or suggest injecting a liquid elastic body into each of the cooling holes, *wherein the cooling holes are formed in the surface of the component such that the cooling holes extend to an air passageway slot formed in the component, with each of the cooling holes having a diameter that is larger than a width of the air passageway slot*, as required by independent claims 73 and 79.

The Examiner also acknowledges on page 5 of the Office Action that Clingman as modified by the RTV-11 Sheet does not disclose injecting a liquid elastic body into each of the cooling holes, and that *an injection amount of the liquid elastic body is adjusted so that a surface of the elastic body injected into each of the cooling holes protrudes above the surface of the component when the liquid elastic body is injected into the cooling holes, and so that the masking pins after hardening do not protrude above the surface of the component*, as required by independent claims 73 and 79. In this regard, the Examiner cites Kang as disclosing a maskant which is injected into cooling holes as a liquid and is then cured, and that the maskant is filled into the cooling holes so as to be flush with the surface of the component, and therefore concludes that it would have been obvious to one of ordinary skill in the art to modify Clingman by injecting the maskant in a liquid state into the cooling holes such that, taking into account any shrinkage of the maskant upon hardening, the cured maskant is flush with the surface of the component.

However, like Clingman and the RTV-11 Sheet, Kang also does not disclose injecting a liquid elastic body into each of the cooling holes, *wherein the cooling holes are formed in the surface of the component such that the cooling holes extend to an air passageway slot formed in the component, with each of the cooling holes having a diameter that is larger than a width of the air passageway slot*, as required by independent claims 73 and 79. In particular, Kang discloses filling cooling holes 4 of a turbine blade 1 with a maskant injected through cooling passages 2. However, Kang does not disclose injecting a liquid elastic body into cooling holes which each have a diameter that is larger than a width of the air passageway slot. Rather, Figs. 4 and 5 disclose that the diameter of the holes 4 is substantially smaller than the width of any passageway to which the cooling holes extend.

Further, on pages 5 and 7 of the Office Action, the Examiner also optionally cites Montierth as disclosing that care should be taken to account for any shrinkage which occurs when forming a mask by injection molding. However, Montierth does not disclose injecting a

liquid elastic body into cooling holes *formed in the surface of the component such that the cooling holes extend to an air passageway slot formed in the component, with each of the cooling holes having a diameter that is larger than a width of the air passageway slot*, as required by independent claims 73 and 79.

Accordingly, as none of the Clingman, RTV-11 Sheet, Kang and Montierth references discloses injecting a liquid elastic body into cooling holes *formed in the surface of the component such that the cooling holes extend to an air passageway slot formed in the component, with each of the cooling holes having a diameter that is larger than a width of the air passageway slot*, as required by independent claims 73 and 79, it is respectfully submitted that the combination of the Clingman, RTV-11 Sheet, Kang and Montierth references does not disclose or suggest all of the limitations of independent claims 73 and 79.

Therefore, for the reasons presented above, it is believed apparent that the present invention as recited in independent claims 73 and 79 is not disclosed or suggested by the Clingman reference, the RTV 11 Sheet, the Kang reference and the Montierth reference taken either individually or in combination. Accordingly, a person having ordinary skill in the art would clearly not have modified the Clingman reference in view of the RTV 11 Sheet, the Kang reference and the Montierth reference in such a manner as to result in or otherwise render obvious the present invention of independent claims 73 and 79.

Further, it is respectfully submitted that the Emer reference does not cure the defects of the Clingman, RTV-11 Sheet, Kang and Montierth references as discussed above.

Therefore, it is respectfully submitted that independent claims 73 and 79, as well as claims 74-78 and 80-88 which depend therefrom, are clearly allowable over the prior art of record.

In view of the foregoing amendments and remarks, it is respectfully submitted that the present application is clearly in condition for allowance. An early notice to that effect is respectfully solicited.

If, after reviewing this Amendment, the Examiner feels there are any issues remaining which must be resolved before the application can be passed to issue, the Examiner is respectfully requested to contact the undersigned by telephone in order to resolve such issues.

Respectfully submitted,

Minoru OHARA

/Walter C. Pledger/

By 2010.06.09 15:49:39 -04'00'

Walter C. Pledger

Registration No. 55,540

Attorney for Applicant

WCP/lkd
Washington, D.C. 20005-1503
Telephone (202) 721-8200
Facsimile (202) 721-8250
June 9, 2010